AS PRESENTED TO YT [this date].



*NOW REORGANIZING.*

# TRANSPARALLEL MEDIA AND WORK SYSTEMS:

## *The HyperLab Zip Editor as Prototype*

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## *If Divided into Articles: Some Possible Titles:*

The Theory of Generalized Transmedia
Theoretical Issues of Generalized Transmedia
The Relation of Media to Work Systems
Substruction and Construct Logic
Projective Constructions and Hyperarchy
Hyperarchy and Substruction

The Transparallel Text Environment

I'm going to call transclusion CROSS-SHARING here.

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## Summary.

This paper discusses a new type of electronic medium and system of work (originally proposed by the author in 1965), now implemented both on workstations and the Internet. •The original 1965 article which introduced the idea of hypertext discussed not only links but transclusion (though the term was introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation. •It offers both links (as in conventional hypermedia) and transclusion, or instancing in comparable contexts. •The current implementation is built around IntelligentPad as a working interface, but has functions that can be used through World Wide Web browsers. •The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

Keywords: • TRANSCLUSION • TRANSPARALLEL MEDIA • VIRTUALITY & the DESIGN OF CONSTRUCT LOGIC • HYPERARCHY & Hyperarchical Editing • CONSTRUCT LOGIC OF HYPERARCHY • INTERFACES • Projective Construction Operations

## [Body of Paper]

## *Intro*

This paper discusses a new type of electronic medium and system of work (originally proposed by the author in 1965 (citation)), now implemented both on workstations and the Internet. It offers both links (as in conventional hypermedia) and transclusion, or instancing in comparable contexts. •This paper focuses entirely on design issues, as the implementation is discussed in detail elsewhere, in papers by my colleagues. •**TRANSCLUSION IS AN OLD IDEA** •It is ironic that while the whole world now knows hypertext, they only know half of the original idea. People are familiar with links but not transclusion. The original 1965 article introducing the idea of hypertext discussed not only links but transclusion (a term introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses design issues of such systems. Other papers by my colleagues deal with the implementation in detail.

## *WORK ENVIRONMENTS AND THEIR VARIETY*

***(For Text Editing •For Outlining •For Resource Management •For Overview • For Versioning)*** •Word processing environment as the center is popular, eg Microsoft Office, ClarisWorks •Likewise integrated software suites •Likewise EMACS, for some •Likewise CASE tools

***Transparallel Media for the Work Environment*** •As a working system, transparallel media show great promise as a unifying framework to simplify work while adding more functionality •As a working system it offers a new kind of overview, and compresses a number of useful functions into one system of visualization.

***Transparallel Media for Transmission, Sharing and Publication*** •As media it suggests a new kind of distributable and publishable hypertext. •As media, transparallel materials may be distributed as packages. There exists also the idea of being able to make comments amongst such sections. •This leads to the notion of MUTUALLY

PARALLEL MEDIA STRUCTURES AND PUBLISHABLE OBJECTS.
•(Which leads to the Xanadu idea of making everything mutually parallelizable.)

## *WORK ENVIRONMENTS AND MEDIA*

**RELATION OF MEDIA TO WORK SYSTEMS** • A book is more fixed than a manuscript; working papers, manuscripts and the like are more sprawling, and do not attempt to give a closed appearance of perfection and completion.

A work system is an environment that can be used for doing things. There are few highly general work systems, however, that are suited to a wide variety of tasks.

Whereas media are bodies of material representing a point of view, in which works are created. •A "work" is hence more fixed; therefore less demanding than a work system, which must have various provisions for work in progress and interconnections i various directions.

• Thus we might think that work systems were more broad than media. However, as soon as a work system is created, someone finds a way to make it a medium, passing along the partial products of that work system.

•However, as nonsequential media become more widespread, they need corresponding work systems • Such work systems can be distributed with media themselves

**HYPERMEDIA**, AS THEY HAVE BECOME POPULAR, have involved surprises, clearing the screen completely, moving from one environment to another. And nothing can typically be used twice in today's hypermedia, except anonymously, with no connection to its original.
★ **WHAT THEY DON'T KNOW** • Irony: The original Hypermedia Paper had Transclusion.

***DISCRETE TRANSPARALLEL CORRESPONDENCE***

***DISCRETE TRANSPARALLEL CORRESPONDENCE***

# *Transparallel Viewing*

By "transparallel" I mean viewable with element-to-element connection, or with global connection.
This can be either between portions of data, or cuts (points between data) or anchors, or whole items or records. •It can be between things which are the same or different.

***DISCRETE TRANSPARALLEL CORRESPONDENCE***

***DISCRETE TRANSPARALLEL CORRESPONDENCE***

•Element-to-element could mean among anchors, among slits, among characters, among paragraphs, among larger textual units, or any combination of the above.

[rollover pic:
explicit connection between
biological object / skeleton and
captions.]

***CONTINUOUS TRANSPARALLEL CORRESPONDENCE***

***CONTINUOUS TRANSPARALLEL CORRESPONDENCE***

**TRANSPARALLEL TISSUES.**

**TRANSPARALLEL TISSUES.** These are structures with global correspondences, not linked in particular parts but having overall correspondences which may be maintained and viewed.

[pic: TRANSPARALLEL TISSUES]

[rollover pic: OVERLAYS]

# TRANSPARALLEL MEDIA AND WORK SYSTEMS

TRANSPARALLEL MEDIA & WORK SYSTEMS: specific connections and correspondences between specific parts, or between and among tissues

Transparallel media give you three things to learn: 1. The meaning of the picture in context A. 2. The meaning of the picture in context B. 3. THE RELATIONSHIP BETWEEN the picture in context A and the picture in context B.

# *The Zip Editor as a Professional Work Environment*

The Zipper List system, or zip editor, was proposed in 1965 as a global information space for professional users. For historical reasons, it has had to wait until now.

INTENDED UNIFIED WORK ENVIRONMENT
There have been several
EMACS
various designs for Integrated Software
The idea is a WORK ENVIRONMENT THAT THE PROFESSIONAL DOES NOT LEAVE. This is a goal most designers have not gone for.

----- SAME FUNX AS WP & DATABASE •Entirely different approach

CENTER OF THE DESIGN same thing reusable and intercomparable in different contexts

HOW TO HANDLE THE RELATED FUNCTIONS IS THE DESIGN PROBLEM

PRINTOUT as an integrated function

----- THE WORK OF PROFESSIONALS
Documents are the heart of a professional's work
•Organizing materials
•Mustering the materials
•Organizing documents
•Professional communications

## TRANSPARALLEL MEDIA

• Side-by-side

•There have always been non-electronic transparallel media. •As an electronic medium, transparallel media offers a new kind of overview and compresses a number of useful functions into one system of visualization.
• **TRANSPOINTING WINDOWS** •In Xanadu designs since at least the mid-sixties •still not implemented EXCEPT BY TOLKACHOV
••**DIFFERENT TRANSPARALLEL LAYOUTS**: columns, multiwindow, annular...
•As media it suggests a new kind of hypertext.
•As a working system it offers a new kind of overview

## *TEXT TRANSPARALLEL VIEWS*

[rollover pic:
Different versions of Bible,
Shakespeare]

## GRAPHICAL TRANSPARALLEL STRUCTURES

GRAPHICAL TRANSPARALLEL STRUCTURES

# HISTORY OF TRANSPARALLEL MEDIA (to 1965)

**HISTORICAL TRANSPARALLEL TEXTS:**•THE ROSETTA STONE •Hexapla of Origen (six Bibles side by side) •The New Testament
**TRANSPARALLEL HYPERTEXT** • The Talmud •Variorum Shakespeare •The Interpreter's Bible •Nabokov, *Pale Fire* •Pavic, Dictionary of the Khazars
***TRANSPARALLEL ILLUSTRATIONS*** •LONG TRADITION, NB Tufte •Grey's Anatomy etc.

¶ **TN's 1965 PAPER** (defining) •In 1965 I published a paper entitled "A File Structure for the Complex, the Changing and the Indetereminate" (BIB). It advocated computers for personal use, and work environments for professional users. •It also presented a design for such professional users, which was a discrete editing system for what I then called "zippered lists" (now shortened to *zips*). •From a historical point of view it may be seen as creating a dividing point between the accidental transparallel media in existence up to that point, and the potential new world of transparallel work. •We will return to this design later.
¶ **TRANSPARALLEL MEDIA ON SCREENS SINCE 1965**
•Transparallel Video: THE ASPEN TAPE (by Kristina Hooper and others, at MIT's Media Lab), presented an explorable video of Aspen, Colorado, as filmed identically at different seasons of the year. The user could not only choose different turns at each intersection (the HYPER level), but also switch in the same shot to different seasons of the year. This is Transparallel, since there is a direct connection between four different hypertissues. This was transparallel correspondence.

[pic:
"The Aspen Tape"]

¶**TRANSPARALLEL 3D GRAPHICAL SYSTEMS.** AutoCAD, and similar systems, have established a tradition of "layers" which are no longer two-dimensional.

[pic:
AutoCAD "layers"]

***CONNECTIONS***

***CONNECTIONS are of TWO TYPES.***

***CONNECTIONS ARE OF TWO TYPES.***
***1. LINKS*** •thought by many to define hypermedia •**LINKS**-- better understood •TRANSPARALLEL VIEWING OF LINKS NOT UNDERSTOOD
***2. TRANSCLUSIONS: PUTTING A THING IN MANY CONTEXTS*** •**TRANSCLUSION** • How can one thing be in a number of contexts at once?

[rollover pic:
ONE ITEM IN MANY
CONTEXTS]

# *TRANSCLUSION*

• Functions of transclusion • Fundamental notion of TRANSCLUSION (hot quote, live sharing) -- ACCESS TO ORIGINAL FROM ANY RE-USE • Equivalent to putting ONE ORIGINAL (not copy) in MANY CONTEXTS •"hot quotes" •think of TCL as multiple threading

[rollover pic:
YOU CAN SEE THAT THE
PIECE IS THE SAME]

[rollover pic:
ONE REAL OBJECT IN
MANY CONTEXTS]

[rollover pic:
REPRESENTATION OF
TRANSCLUSION:
THE SAME PIECE IN
MANY DOCUMENTS]

***LINK AND TRANSCLUSION TOGETHER***

Links and Transclusions are complementary

**TRANSPARALLEL TRANSCLUSION.** •THE SAME THING IN MORE THAN ONE CONTEXT.

FIRST IMAGINE A TRANSPARALLEL SYTEM WITH LINKS ONLY. •Then transparallel with Transclusions only. •Then both. •Overlapping •Non-overlapping

## XANALOGICAL SYSTEMS

Xanalogical systems are computer systems which offer both links and transclusions.

**DUALITY OF VIEWS.** **1.** Anything can be in many places at once. **1.** Different instances are identified as the same.

[pic:
LATTICE OF
XANALOGICAL AND
TRANSPARALLEL
SYSTEMS]

• **TOWARD A FORMAL DEFINITION OF XANALOGICAL SYSTEMS** • TWO RELATIONSHIPS • A Typology of Xanalogical Systems • **DISCRETE XANALOGICAL SYSTEMS** • Xanalogical systems with NO OVERLAP: ZIPPER LISTS, or Zips

[pic:
LATTICE OF
XANALOGICAL AND
TRANSPARALLEL
SYSTEMS]

## *ZIPPER LISTS*

***Discrete Zipper List*** •**ZIPPER LISTS**, a simple case •COLUMNAR ARRANGEMENT •NO OVERLAP OF ITEMS •LINKS NOT TYPED •LOCAL ONLY

## *THE 1965 DESIGN*

**Z65** • The 1965 system represents a very simple and CLEAN design • Sufficient for Highly Complex Work • The 1965 big illustration:

[rollover pic:
BIG ILLUSTRATION FROM
1965]

# *What Zips Are* ----------

**DEFINITION OF ZIPPER LISTS** (still in oscillation, definitions are very hard to do right)

★ ZIPS (informal) •SIDE-BY-SIDE COLUMNS with CRISS-CROSS CONNECTIONS •Discrete structures which can be coupled together out of sequence •DISCRETE TRANSPARALLEL MEDIA •A system for parallel-column hypertext, linked every whichway. It is how a lot of stuff should be best organized, I think, for research and understanding.
•CORRESPONDING LISTS
•Discrete sequences which can be coupled together out of sequence. •May be used as an under-structure for cross-filing, intercomparison, showing the evolution of versions, commentary on corresponding parts of two objects.

**Rule: between any two zips, two elements can have at most one connection** (link or transclusion). •This rule generates my 1965 design; its subtleties go beyond this note.

Sample visualization: List A is a vertical column on your screen, in its own sequence. Corresponding items from List B are shown in an adjacent column, next to their partners in List A; but they are out of sequence, so broken lines divide column B. Another visualization: again two columns, but both are in their respective correct sequences; so lines connecting the partner-items cross in various diagonals.
•**GRIDLIKE STRUCTURES.** Also assembles into tables, spreadsheeets etc. with exceptions (not possible in spreadsheets).•Gridlike structures; Gridlike structures WITH EXCEPTIONS
•Zipper lists are a special case of what I now call TRANSPARALLEL MEDIA-- connected objects shown together with their interconnections.
•(A newspaper front page is a PARALLEL medium, because the connections between articles, or between an article and a related picture, are usually inexplicit, with neither referring directly to the other. •Explicit connections make it transparallel.)

## *DISCUSSION OF USES*

# *FUNCTIONS of Zipper Lists*

***Simple Uses of the 1965 Design*** • Zipper lists for VERSIONING • Marching Versions • Captions • Details • Disagreements • Corroborations • Footnotes • Expansions • ***For Text Editing •For Outlining •For Resource Management •For Overview*** •Word Processing •Email •Outlining •Organization of work •Version management -- successive and alternative

# *Functions of Zips* ----------

★★★ LIST INTEGRATION AND MAINTENANCE, LIST COORDINATION

¶item on two lists

•combining lists •checking things off •making sure items (or people) are taken care of

•For no good reason, we CONSTANTLY HAVE TO COMPARE LISTS! Seeing what's on more than one list, checking things off from List A if they're on List B, adding things to List A if they're on List C, etc.

•this should greatly speed up all these functions

•Zipper lists show the comparison relation

★ CHECKLISTS! "Has this been done yet?" •Use for checklists was always a KEY ASPECT OF THE DESIGN.

•"Who's paired up with whom" -- eg breeding schedule for prize cattle

¶re-delegating, redistributing tasks among separate users or servers: OVERVIEW OF WHAT THINGS ARE HANDLED BY WHAT, WHAT IS ASSOCIATED WITH WHAT

Zips (and xanalogical structure) as the GENERALIZATION of inclusion, importation, aliasing, soft links-- all are forms of virtual inclusion of which transclusion is the COMPLETE form.

•OVERVIEWS OF RELATIONSHIPS

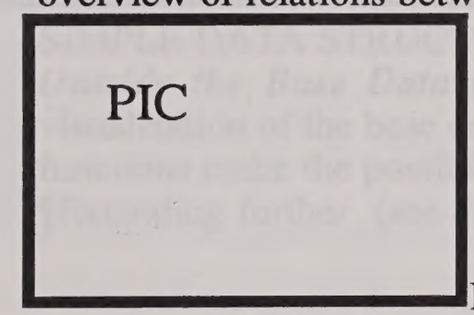
•KEEPING TRACK OF THINGS which are OUT OF ORDER

•eg "production elements" of a movie-- pieces of film, pieces of audio, which are scattered around on negatives, audiotapes, reels of video, computer files.

INTERNAL DIRECTORY OF AN ONGOING PROJECT (brings clarification)
•OVERVIEWS OF REARRANGEMENT ••Great example: RESEQUENCING OF AUDIOTAPES. •Zip structure can show both the current structure and the desired structure (or several desired structures) simultaneously

ANNOTATIONS•INTERCOMPARISON OF VERSIONS
•SENDING ANNOTATIONS TO COLLEAGUES

Marginal notes for any purpose (can always add ANOTHER Zip, so the new notes need not interfere with the old)
•the equivalent of HIGHLIGHTING, UNDERLINING ••things can be emphasized by another zip, but emphasis is not seen unless both zips are seen.
ALTERNATIVE STRUCTURES
VERSION MANAGEMENT
•overview of relations between and among versions



Picture of audiotape data, structured as Zips
•ASSEMBLY OF MANY PIECES
•Example: EMAIL THREADING ON ZIPS, making consecutive narratives and NEXT-TO comments, along with transclusion of the same and overlapping portions into various emails (the more general form of the pointy email quotation flags)
•ALTERNATIVE STRUCTURES •OVERVIEW OF VERSION DIFFERENCES

•MARCHING TRANSPARALLEL VERSIONS

[pic:
Marching Transparallel
Versions]

## The Variety of Visualizations

EVEN WITH THESE SIMPLE DATA STRUCTURES, there are many possible vizns
***Outside the Base Data Level of Visualization*** •Outside the visualization of the base data, it could go in many directions. •Adding functions make the possibilities much more varied.
¶Extending further (see Substruction).

# *Additional Functionalities Needed for Zips* ----------

Projection necessary because consequences are complex
Compress the levels
Compress the levels hierarchically
Compare the levels HYPERarchically

## *HOW ADD FUNCTIONS?*

***Additional functions needed***

Other functions need to be added; this raises interesting design issues (see Substruction of the Virtuality, below). •Assembly of Linear Versions •Printing •Comparison of

***Great Example***

Alternative Versions

## *HYPERARCHY*

Hyperarchy

## *THE CURRENT IMPLEMENTATION*

**HL96 "ZipEditor"**

***Principal Features of Current Version***

• ***(Notes on*** INTELLIGENTPAD) •The current implementation is built around IntelligentPad as a working interface, but has functions that can be used through World Wide Web browsers. •NICE REMARKS about INTELLIGENTPAD

•At the data level (and in its basic visualization), the current implementation exactly implements the original design of the 1965 paper (citation)

**STRUCTURE: ¶ELEMENTS** • ASCII characters •Text Items •Zips •Links •Transclusions

**¶RULES** •items may not overlap •simple untyped links •transclusion •each cell may connect to ONE OTHER CELL in each other Zip

¶VISUALIZATION ***Visualization of the Current Version***

•(At the data level and) in its basic visualization, the visualization of the current workstation implementation exactly implements the original design of the 1965 paper (citation). •It SIMPLY SHOWS THE DATA

STRUCTURE, as in the 1965 design.

• THE SPECIFIC IMPLEMENTATION • THE VARIOUS THINGS HL96 COULD DO • Data Types • Hierarchy • Hyperarchy

## *Other Possible Visualizations of Zip Editors: Other Languages*

Our zip editor is Vertical •Identical function for vertical kanji or for Chinese, or other vertical alphabets •Interesting variant: linking vertical writing to horizontal writing

## *Other Possible Visualizations of Zip Editors: Handling Alternatives of Organization*

***ALTERNATIVE DESIGNS FOR ZIP VISUALIZATION with Hyperarchy***
***• Rays, Fans •Projection***

8

## *Other Possible Transparallel Media*

**¶ COULD HAVE A TRANSPARALLEL WEB BROWSER**
•Indeed, Netscape could be adapted to show side by side the Web pages you are going FROM and the Web pages you are going TO.

[pic:
Transparallel Web Browser]

¶ **TRANSPARALLEL DATABASE** • queriable data points yield indiv. record & same data pt in other graph -- Prof. Chiba
As processor power grows-- for instance, video in multiple windows-- more and more desirable structures

¶TRANSPARALLEL FILM AND VIDEO: HALT ACTION IN ONE WINDOW, SEE SAME SHOT IN ANOTHER CONTEXT ¶Leni

[Rollover pic:
TRANSCLUSIVE
RIEFENSTAHL MOVIE]

Riefenstahl example

***Substruction***

***UNIVERSAL***
***TRANSMEDIA***
***My General Proposal.***

**Universal Transmedia (my general Xanadu proposal)**

## *Generalized Transparallel Media: the Full Xanadu Proposal*

• HIGHLY GENERALIZED transparallel world
••••• Xanadu is a Substructure for the manipulation and viewing of EVOLVING TRANSPARALLEL STRUCTURES.
•The global Xanadu proposal is A PROPOSAL FOR A DIFFERENT FORM OF INFORMATION WHERE EVERYTHING CAN BE FREELY RE-USED AND EASILY INTERCOMPARED.
**The Xanadu idea of making everything mutually parallelizable.**

(**TRANSCOPYRIGHT** • A legal and business issue, not to be discussed here)

***Other Visualizations of Generalized Transparallel Media***
•Columnar •Rays •Fans •Light up to show correspondences (used in various Macintosh programs) •Annular •Zooms etc. •Transparency, semitransparency •parallel 3D windows •Aspen-tape switching

***FUTURE DESIGNS: Concentrate on Interface, the Media are Generalized***

***Other user conceptual structures may be superimposed or embedded in this structure***

## *Theoretical Issues*

**INTERFACES** • Interfaces are arbitrary •CLOSER TO THE DATA STRUCTURE, THE BETTER I LIKE IT

**Substruction as a Theoretical Issue**

**SUBSTRUCTION AS A THEORETICAL ISSUE**

**Is transclusion a SUBSTRUCTURE? Or a METASTRUCTURE?**
**WHAT'S THE DIFFERENCE BETWEEN SUBSTRUCTURE AND METASTRUCTURE?**
**Ans. A Substructure should be what your main concepts are made out of;**
**metastructure, what you can make them into.**
**So I guess it's a metastructure, to be substructed variously.**

0

**The Theory of Adding Functions: What Virtuality?**

***•New Functions and Their Substruction***
***•Substruction versus Metastructure***
***¶ SUBSTRUCTION OF THE DESIRED VIRTUALITY •for Outlining •for Printout •for Hyperarchy***
The difference between Substruction and Mere Implementation:
•Substruction is creating CONCEPTS YOU'RE SUPPOSE TO KNOW ABOUT or BE INTERESTED IN.
★ SUBSTRUCTING a SUBVIRTUALITY •Eg textholes, textpipes
★ SUPERSTRUCTING A SUPERVIRTUALITY/METAVIRTUALITY
•Eg combining 2D spreadsheets into ND spreadsheets
•TRANS-STRUCTING?
★★★★★ OMNISTRUCTING? •SUBSTRUCTING, SUPERSTRUCTING and RESELECTING at the same time.

# HYPERARCHY
## AS A THEORETICAL AND INTERFACE ISSUE

The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.
• **CONSTRUCT LOGIC OF HYPERARCHY**: the Mapping of Hyperarchy to Z65, Z96 • **HYPERARCHY ALTERNATIVES**: Transclusion Cuts • Outside Projections

## Rays, Fans, and Projective Constructions

RAYS AND FANS as an unusual virtuality mechanism
Rays in the 1965 paper
• **PROJECTIVE CONSTRUCTION ALTERNATIVES**: Different Rays, Reflections, Magic Cookies
**PROJECTIVE CONSTRUCTIONS** AS A THEORETICAL AND INTERFACE ISSUE • **CONSTRUCT LOGIC OF PROJECTIVE CONSTRUCTIONS**

# ZIP RAY LOGIC

## *Projections of Consequences ----*

The objective of Zip Rays is to show connections-- •On a broad scale (large-scale view of work) •Locally, between several zips.
The connections to be shown: **Transclusions** (double line if possible, for extended "Equal" relation) •**Links** (single line, possibly animation) •**Combinations**-- indicating what zips made up another one

IN PRINCIPLE, WE WANT TO BE ABLE TO SHOW COMPLETE GRAPH. •In practice, we want to reduce that to some manageable subset. •The main issue: TO LOCALIZE AND REDUCE the rays. •A second issue: HOW TO SHOW COMBINATIONS. •A third: HOW TO TURN THEM UP AND DOWN (alpha channel)!

Merging two zips is going to be an important function

•Extending further (see Substruction).

•Outside the visualization of the base data, it could go in many directions.

•Adding functions make the possibilities much more varied.

## BIBLIOGRAPHY

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## SUPPLEMENT:

# HO d23

— OUTLINING
Hyperarchy
Two kinds of connection •Items • parts

— BIBLIOGRAPHY •HART •LM etc.

Original article PRECEDED word processing as we know it
EXPLANATION OF THE DESIGN

[Better omitted]

My ideas don't change much, but my attempts to explain them keep evolving

As to a demo, I'll be happy to show you what's running. It's quite preliminary, and there are performance issues due to the present Unix version of Intelligent Pad (which Tandem says will be fixed soon), but it's the first instantiation of some of the things I've been talking about.

Best regards, Ted

>

> Many thanks. Let me know what you think.
>
> Regards, David Hamilton

, maybe you can say it better--

newpage

# *HO d23* ----------

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----- OUTLINING
Hyperarchy
Two kinds of connection •Items = paras

----- BIBLIOGRAPHY •HART •LM etc.

Original article PRECEDED word processing as we know it
EXPLANATION OF THE DESIGN

[footer omitted]

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- - - - -

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Best regds, Ted

>

> Many thanks. Let me know what you think.
>
> Regards, David Hamilton

; maybe you can say it better--

Others find the model exotic; to me it's a fundamental building block.

# *zips.for.hamilton*

[from email to David Hamilton, Wall Street Journal, 95.9.7]

---

From ted Thu Sep 7 00:16:13 1995
To: dph@twics.com
Subject: "ANSWER 2. ZIPPER LISTS--
Bcc: marlene@xanadu.net
Content-Length: 2683

ANSWER 2. ZIPPER LISTS--

...> especially if you and Okubo-san
> have finished the first implementation of the ziplist. (Speaking of which,
> I've paged through Literary Machines a couple of times, and I still can't
> find a definition of what a zipper list is.)

# *ZIP.ETC.INPUT*

## *(Materials from notes of last months)*

bringing in also

## *zips.for.hamilton.d1*

## *zip.ray.logic.d2*

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At the Sapporo HyperLab, we have worked together to get a new
implementation •I.Pad •My design •Technical implementation by others

MOVIE ELEMENTS

# *endHO d23* ----------

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# *HO d20* ----------

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Transparallel transclusion means there are three things to understand: the object in Context A; the object in Context B; and the relation between them

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THE 1965 PAPER

The Xanadu* project, started in 1960, is known for its ambitions of populist on-line publishing (1), a form of which has now been achieved by the World Wide Web. The Web has had the impact we expected for the Xanadu project.

The deeper objective of the Xanadu project is less well known: a new kind of universal digital medium, where all media objects can be freely re-used, interconnected and intercompared sideways-- while still respecting copyright.

We believe this is still a valid objective. It means two different forms of connection: LINKS, with which many people are now familiar, and TRANSCLUSIONS, or connections betwen parts which are the SAME-- instances which may be compared in different contexts (2). This enables

any object to be in many places at once, with utter clarity as to its origin and ownership. This offers an interesting solution to the copyright issue.

Indeed, we believe that generalized transclusion offers a solution for the principal problems of hypermedia, and opens a much wider horizon for digital media-- which become no longer limited to separated objects.

While Project Xanadu has had considerable influence (arguably as the basis for HyperCard, World Wide Web and Lotus Notes), it has not yet shipped a product, partly due to the escalating ambition of its successive designs (1).

At the Sapporo HyperLab, we have gone back to basics to implement the most fundamental concept. A workstation implementation of the 1965 design (3) has been implemented, maintaining both links and transclusions in transparallel presentation. This can now be demonstrated on video, the first Xanadu-class system which can be shown with a user interface.

Meanwhile, Xanadu's transclusive copyright system has been redefined in an implementation-independent form, summarized by the word "transcopyright." This is a permission doctrine that allows material to be included virtually in any new on-line context, provided that each new recipient obtains the data elements from the rightsholder.

* Registered trademark of Project Xanadu, Sausalito, CA, USA.

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# *HO d19* ----------

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**Summary of Presentation for 1996 IMAGINA Conference, Monte Carlo**

## *DEEPER CONNECTION FOR TOMORROW'S MEDIA*

This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation.
TRANSPARALLEL MEDIA IN THE PAPER WORLD

# *HO d18* ----------

----------Transclusion allows the same thing to be in many places and intercompared in these different contexts.

# *HO d17* ----------

----------intercompared sideways, part-for-part--
which are the SAME-- instances in new contexts (2).
wider vision of digital media

# HO d15 ----------

----------In a parallel development
transclusion still offers a solution

# HO d14 ----------

----------under the name "transcopyright."

# FULL CONNECTION FOR TOMORROW'S MEDIA

# HO d12 ----------

----------The system was designed to maintain two different forms of connection:
overlapping transclusions

# HO d11 ----------

----------

# HO d10 ----------

---

# *XANADU IN THE WORLD: Transmedia for Tomorrow*

## *HO d9* ----------

----------*[new]*

two different forms of connection were its design

## *[previous draft]* ----------

---

## *XANADU MOVES INTO THE WORLD*

The Xanadu project* has a somewhat legendary status, due to its broad objectives and apparently considerable influence: indirect results of Project Xanadu already include, arguably, World Wide Web, HyperCard** and Lotus Notes**. However, no software product of signifcance has resulted directly from the work until the present.

The Xanadu project may be traced to a paper of thirty years ago (1) which introduced not only the words "hypertext" and "hypermedia," but also the ideas of transparallel electronic media and transclusion (not under those names). •

By transparallel media I mean any media where objects may be seen together with specific connections shown between their parts. (Examples from paper publishing include biological illustrations with captions and columnar

presentation of text with side-by-side commentary. In transparallel media, the reader or user sees, and may seek to understand, at least three things: the first object, the second object, and the interconnections.

But the fundamental notion of the Xanadu project has been what we now call TRANSCLUSION (also "hot quote" or "live sharing). It means having access to the original of a piece of media from one of its re-uses. (Thus the re-use cannot be just a byte copy.) This has many purposes: intercomparison of context, understanding in different contexts, and a clean solution for copyright (to be discussed below). It is equivalent to putting THE ORIGINAL PIECE OF MEDIA (not a copy) in MANY SEPARATE CONTEXTS.

The Xanadu project, above all, has promoted a GENERAL META-DESIGN FOR ALL MEDIA, where transclusion may be used freely for both understanding and convenience. We now call this GENERAL OPEN TRANSMEDIA (as described in (2), though not under that name)-- the general situation where anyone may quote and link to anything, without copyright hindrance.

World Wide Web has shown the benefits of network hypertext publishing; but we may now see concretely the inconvenience of having only one-way links, no way to follow them to their origin, no way to quote material already published by others, and no stable committed publication: Web pages disappear unpredictably like popping bubbles. The Xanadu design was created in anticipation of all these problems.

The implementation sponsored at Autodesk from 1988 to 1992 is still underway (2), but considerably hampered by lack of resources. Meanwhile, new large-scale designs and new implementations are underway, based on the realities of the Internet and such developments as the apparent coup d'etat of the Internet by Netscape.

In the meantime, back-to-basics implementation at Sapporo HyperLab, to clarify what has been possible all along

**MEDIA AND WORK SYSTEMS** • A CONTINUUM, DEEPLY RELATED • book is more fixed, manuscripts andc. are more sprawling • Thus we might think that work systems were more broad than media • However, as nonsequential media become more widespread, they need corresponding work systems • Such work systems can be distributed with

media themselves

**HYPERMEDIA**, AS THEY HAVE BECOME POPULAR • **WHAT THEY DON'T KNOW** • The original Hypermedia Paper had Transclusion

**XANALOGICAL SYSTEMS** • TWO RELATIONSHIPS • No overlap: ZIPPER LISTS, or Zips

**TRANSPARALLEL MEDIA** • Side-by-side or connecting media • TRANSPARALLEL MEDIA IN THE PAPER WORLD • TRANSPARALLEL MEDIA ON SCREENS • TRANSPOINTING WINDOWS • ZIPPER LISTS • VERSIONING • Marching Versions • Captions • Details • Disagreements • Corroborations • Footnotes • Expansions • HISTORICAL TRANSPARALLEL MEDIA: Bible(s), Talmud, Shakespeare, Nabokov, Pavic • DIFFERENT TPL LAYOUTS: columns, multiwindow, annular...

**HL96** • THE SPECIFIC IMPLEMENTATION of the 1965 design by Mr. K. Ookubo • THE VARIOUS THINGS HL96 COULD DO • Data Types • Hierarchy • Hyperarchy

* Registered trade mark of Project Xanadu, Sausalito, California, USA. ** Trademarks of various owners.

**BIBLIOGRAPHY.** • (1) T. Nelson, "A File Structure for the Complex, the Changing and the Indeterminate." Proceedings of the ACM 1965 National Conference. • (2) T. Nelson, LITERARY MACHINES EDITION 94.1. Mindful Press, 3020 Bridgeway Suite 295, Sausalito CA 94965, USA. • (3) "The Heart of Connection: Hypermedia Unified by Transclusion." Communications of the ACM, August 1995.

**HYPERARCHY** AS A THEORETICAL AND INTERFACE ISSUE

Fundamental notion of TRANSCLUSION (hot quote, live sharing) -- ACCESS TO ORIGINAL FROM ANY RE-USE • Equivalent to putting ONE ORIGINAL (not copy) in MANY CONTEXTS
Numerous possible consequences and uses
So the problem of INTERCOMPARING CONTEXTS (TPL MEDIA)

***Theoretically:*** TRANSCOPYRIGHT: A WIN-WIN COPYRIGHT ARRANGEMENT • Esp. suited to small publishers • Pre-permission arrangement for new contexts

## ----- *Concretely at HyperLab:*

Zip Editor (1965 design) - Web interface underway • (to be public domain software)

The Sapporo HyperLab has been put together to support international cooperation in computer research, with the generous support of a number of companies***.

*** Specifically the generous support of (in alphabetical order), ASCII Corporation, Fuji Xerox, Fujitsu, Hitachi, Hokkaido University, Mallicoat Consulting, NTT, Sapporo Electronic Center, Technova, Xanadu Hypercompany.

HOzone

# *HO d2* ----------

words words words words words words words words words words '''

## *HO d3* ----------

# *as exemplified by the HyperLab Zip Editor*

## *HO d4* ----------

***TRANSPARALLEL MEDIA***
***AND WORK SYSTEMS:***
***The HyperLab Zip Editor as Prototype***

Difficulties of implementation and organizational politics have slowed things down -- not known whether that implementation will work

**SUPPLEMENT**: THE 1965 PAPER

(**TRANSCOPYRIGHT** • A legal and business issue, not to be discussed here)

**INTERFACES** • Interfaces are arbitrary

**Z65** • The 1965 system represents a very simple and CLEAN design • Sufficient for Highly Complex Work • The 1965 big illustration

Summary of Paper: The original article introducing the idea of hypertext discussed not only links but transclusion (a term introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation. The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

Summary of Theoretical Issues: • TRANSCLUSION • TRANSPARALLEL MEDIA • VIRTUALITY & the DESIGN OF CONSTRUCT LOGIC • HYPERARCHY & Hyperarchical Editing • CONSTRUCT LOGIC OF HYPERARCHY • INTERFACES • Projective Construction Operations

## *HO d5* ----------

• **CONSTRUCT LOGIC OF HYPERARCHY**: the Mapping of Hyperarchy to Z65, Z96 • **HYPERARCHY ALTERNATIVES**: Transclusion Cuts • Outside Projectsions

**PROJECTIVE CONSTRUCTIONS AS A THEORETICAL AND INTERFACE ISSUE** • **CONSTRUCT LOGIC OF PROJECTIVE CONSTRUCTIONS**: the Mapping of Hyperarchy to Z65, Z96 • **PROJECTIVE CONSTRUCTION ALTERNATIVES**: Different Rays, Reflections, Magic Cookies

• **TOWARD A FORMAL DEFINITION OF XANALOGICAL SYSTEMS** • A Typology of Xanalogical Systems • **DISCRETE XANALOGICAL SYSTEMS**

## *HO d6* ----------

## *[shrinking the HOs that came from zip.report.d7]*

***HO d7*** ----------

A broader concept is GENERAL OPEN TRANSMEDIA (as described in (2)

***HO d8*** ----------

***HO d9*** ----------

***HO d13*** ----------

Zip.report.d20.wide [as edited]



# TRANSPARALLEL MEDIA AND WORK SYSTEMS

## *The HyperLab Zip Editor as Prototype*

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### *Summary.*

This paper discusses a new type of electronic medium and system of work (originally proposed by the author in 1965), now implemented both on workstations and the Internet.

The original 1965 article which introduced the idea of hypertext discussed not only links but transclusion (though the term was introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation.

It offers both links (as in conventional hypermedia) and transclusion, or instancing in comparable contexts.

•The current implementation is built around IntelligentPad as a working interface, but has functions that can be used through World Wide Web browsers.

The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

Keywords: • TRANSCLUSION • TRANSPARALLEL MEDIA • VIRTUALITY & the DESIGN OF CONSTRUCT LOGIC • HYPERARCHY & Hyperarchical Editing • CONSTRUCT LOGIC OF HYPERARCHY • INTERFACES • Projective Construction Operations

1

### *[Body of Paper]*

### *Intro*

This paper discusses a new type of electronic medium and system of work (originally proposed by the author in 1965 (citation)), now implemented both on workstations and the Internet. It offers both links (as in conventional hypermedia) and transclusion, or instancing in comparable contexts.

This paper focuses entirely on design issues, as the implementation is discussed in detail elsewhere, in papers by my colleagues.

TRANSCLUSION IS AN OLD IDEA •It is ironic that while the whole world now knows hypertext, they only know half of the original idea. People are familiar with links but not transclusion. The original 1965 article introducing the idea of hypertext discussed not only links but transclusion (a term introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses design issues of such systems. Other papers by my colleagues deal with the implementation in detail.

### *WORK ENVIRONMENTS AND THEIR VARIETY*

***(For Text Editing •For Outlining •For Resource Management •For Overview • For Versioning)***
Word processing environment as the center is popular, eg Microsoft Office, ClarisWorks
Likewise integrated software suites
Likewise EMACS, for some
Likewise CASE tools

***Transparallel Media for the Work Environment***
As a working system, transparallel media show great promise as a unifying framework to simplify work while adding more functionality
•As a working system it offers a new kind of overview, and compresses a number of useful functions into one system of visualization.

***Transparallel Media for Transmission, Sharing and Publication***
As media it suggests a new kind of distributable and publishable hypertext.
As media, transparallel materials may be distributed as packages. There exists also the idea of being able to make comments amongst such sections.

This leads to the notion of MUTUALLY PARALLEL MEDIA STRUCTURES AND PUBLISHABLE OBJECTS
(Which leads to the Xanadu idea of making everything mutually parallelizable.)

### *WORK ENVIRONMENTS AND MEDIA*

RELATION OF MEDIA TO WORK SYSTEMS • A book is more fixed than a manuscript; working papers, manuscripts and the like are more sprawling, and do not attempt to give a closed appearance of perfection and completion.

A work system is an environment that can be used for doing things. There are few highly general work systems, however, that are suited to a wide variety of tasks.

Whereas media are bodies of material representing a point of view, in which works are created. •A "work" is hence more fixed; therefore less demanding than a work system, which must have various provisions for work in progress and interconnections i various directions.

• Thus we might think that work systems were more broad than media. However, as soon as a work system is created, someone finds a way to make it a medium, passing along the partial products of that work system.

•However, as nonsequential media become more widespread, they need corresponding work systems • Such work systems can be distributed with media themselves

**HYPERMEDIA, AS THEY HAVE BECOME POPULAR, have involved surprises, clearing the screen completely, moving from one environment to another. And nothing can typically be used twice in today's hypermedia, except anonymously, with no connection to its original.**

**• WHAT THEY DON'T KNOW • Irony: The original Hypermedia Paper had Transclusion**
***DISCRETE TRANSPARALLEL CORRESPONDENCE***

## *Transparallel Viewing*

**By "transparallel" I mean viewable with element-to-element connection, or with global connection.**
**This can be either between portions of data, or cuts (points between data) or anchors, or whole items or records. •It can be between things which are the same or different.**
***DISCRETE TRANSPARALLEL CORRESPONDENCE***
**•Element-to-element could mean among anchors, among slits, among characters, among paragraphs, among larger textual units, or any combination of the above.**

**[rollover pic: explicit connection between biological object / skeleton and captions.]**

***CONTINUOUS TRANSPARALLEL CORRESPONDENCE***
**TRANSPARALLEL TISSUES. These are structures with global correspondences, not linked in particular parts but having overall correspondences which may be maintained and viewed.**

**[pic: TRANSPARALLEL TISSUES]**

**[rollover pic: OVERLAYS]**

## TRANSPARALLEL MEDIA AND WORK SYSTEMS

**TRANSPARALLEL MEDIA & WORK SYSTEMS: specific connections and correspondences between specific parts, or between and among tissues**

**Transparallel media give you three things to learn: 1. The meaning of the picture in context A. 2. The meaning of the picture in context B. 3. THE RELATIONSHIP BETWEEN the picture in context A and the picture in context B.**

## TRANSPARALLEL MEDIA

**• Side-by-side**

**•There have always been non-electronic transparallel media. •As an electronic medium, transparallel media offers a new kind of overview and compresses a number of useful functions into one system of visualization.**

**• TRANSPOINTING WINDOWS •In Xanadu designs since at least the mid-sixties •still not implemented EXCEPT BY TOLKACHOV**

**DIFFERENT TRANSPARALLEL LAYOUTS: columns, multiwindow, annular...**

**•As media it suggests a new kind of hypertext.**

**•As a working system it offers a new kind of overview**

## *TEXT TRANSPARALLEL VIEWS*

[rollover pic:
Different versions of Bible, Shakespeare]

**GRAPHICAL TRANSPARALLEL STRUCTURES**

## HISTORY OF TRANSPARALLEL MEDIA (to 1965)

**HISTORICAL TRANSPARALLEL TEXTS:** •THE ROSETTA STONE •Hexapla of Origen (six Bibles side by side) •The New Testament

**TRANSPARALLEL HYPERTEXT** • The Talmud •Variorum Shakespeare •The Interpreter's Bible •Nabokov, *Pale Fire* •Pavic, Dictionary of the Khazars

***TRANSPARALLEL ILLUSTRATIONS*** •LONG TRADITION, NB Tufte •Grey's Anatomy etc.

**TN's 1965 PAPER** (defining) •In 1965 I published a paper entitled "A File Structure for the Complex, the Changing and the Indetereminate" (BIB). It advocated computers for personal use, and work environments for professional users. •It also presented a design for such professional users, which was a discrete editing system for what I then called "zippered lists" (now shortened to *zips*). •From a historical point of view it may be seen as creating a dividing point between the accidental transparallel media in existence up to that point, and the potential new world of transparallel work. •We will return to this design later.

• **TRANSPARALLEL MEDIA ON SCREENS SINCE 1965** •Transparallel Video: THE ASPEN TAPE (by Kristina Hooper and others, at MIT's Media Lab), presented an explorable video of Aspen, Colorado, as filmed identically at different seasons of the year. The user could not only choose different turns at each intersection (the HYPER level), but also switch in the same shot to different seasons of the year. This is Transparallel, since there is a direct connection between four different hypertissues. This was transparallel correspondence. ¶TRANSPARALLEL 3D GRAPHICAL SYSTEMS. AutoCAD, and similar systems, have established a tradition of "layers" which are no longer two-dimensional.

[pic:
"The Aspen Tape"]

[pic:
AutoCAD "layers"]

## *CONNECTIONS*

*1. LINKS* •thought by many to define hypermedia •LINKS-- better understood •TRANSPARALLEL VIEWING OF LINKS NOT UNDERSTOOD

*2. TRANSCLUSIONS: PUTTING A THING IN MANY CONTEXTS*
TRANSCLUSION • How can one thing be in a number of contexts at once?

[rollover pic:
ONE ITEM IN MANY CONTEXTS]

• Functions of transclusion • Fundamental notion of TRANSCLUSION (hot quote, live sharing) -- ACCESS TO ORIGINAL FROM ANY RE-USE • Equivalent to putting ONE ORIGINAL (not copy) in MANY CONTEXTS •"hot quotes" •think of TCL as multiple threading

[rollover pic:
YOU CAN SEE THAT THE PIECE IS THE SAME]

[rollover pic:
ONE REAL OBJECT IN MANY CONTEXTS]

[rollover pic:
REPRESENTATION OF
TRANSCLUSION:
THE SAME PIECE IN
MANY DOCUMENTS]

***LINK AND TRANSCLUSION TOGETHER***
Links and Transclusions are complementary

TRANSPARALLEL TRANSCLUSION. •THE SAME THING IN MORE THAN ONE CONTEXT.

[pic:
LATTICE OF
XANALOGICAL AND
TRANSPARALLEL
SYSTEMS]

FIRST IMAGINE A TRANSPARALLEL SYTEM WITH LINKS ONLY. •Then transparallel with Transclusions only. •Then both. •Overlapping •Non-overlapping

## XANALOGICAL SYSTEMS

Xanalogical systems are computer systems which offer both links and transclusions. DUALITY OF VIEWS. 1. Anything can be in many places at once. 1. Different instances are identified as the same.

• TOWARD A FORMAL DEFINITION OF XANALOGICAL SYSTEMS • TWO RELATIONSHIPS • A Typology of Xanalogical Systems • DISCRETE XANALOGICAL SYSTEMS • No overlap: ZIPPER LISTS, or Zips

## *THE 1965 DESIGN*

***Discrete Zipper List*** •COLUMNAR ARRANGEMENT •NO OVERLAP OF ITEMS •LINKS NOT TYPED •LOCAL ONLY
ZIPPER LISTS, a simple case

[pic:
LATTICE OF
XANALOGICAL AND
TRANSPARALLEL
SYSTEMS]

Z65 • The 1965 system represents a very simple and CLEAN design • Sufficient for Highly Complex Work

• The 1965 big illustration:

[rollover pic:
BIG ILLUSTRATION FROM
1965]

• Zipper lists for VERSIONING • Marching Versions • Captions • Details • Disagreements • Corroborations • Footnotes • Expansions • ***For Text Editing •For Outlining •For Resource Management •For Overview***

## *DISCUSSION OF USES*

***Simple Uses of the 1965 Design***
Word Processing
Email
Outlining
Organization of work
Version management -- successive and alternative
MARCHING TRANSPARALLEL VERSIONS

[pic:
Marching Transparallel
Versions]

Hyperarchy

***Outside the Base Data Level of Visualization***
EVEN WITH THESE SIMPLE DATA STRUCTURES, there are many possible vizns
Extending further (see Substruction). •Outside the visualization of the base data, it could go in many directions. •Adding functions make the possibilities much more varied.

***Additional functions needed***
Other functions need to be added; this raises interesting design issues (see Substruction of the Virtuality, below). •Assembly of Linear Versions •Printing •Comparison of Alternative Versions

## *THE CURRENT IMPLEMENTATION*

***Principal Features of Current Version***
HL96
INTELLIGENTPAD •The current implementation is built around IntelligentPad as a working interface, but has functions that can be used through World Wide Web browsers. •NICE REMARKS about INTELLIGENTPAD
At the data level (and in its basic visualization), the current implementation exactly implements the original design of the 1965 paper (citation)
STRUCTURE •Text Items •Zips •Links •Transclusions
•items may not overlap •simple untyped links •transclusion •each cell may connect to ONE OTHER CELL in each other Zip

• THE SPECIFIC IMPLEMENTATION • THE VARIOUS THINGS HL96 COULD DO • Data Types • Hierarchy • Hyperarchy

***Visualization of the Current Version***
(At the data level and) in its basic visualization, the visualization of the current workstation implementation exactly implements the original design of the 1965 paper (citation). •It SIMPLY SHOWS THE DATA STRUCTURE, as in the 1965 design.

## *Visualizations of Zip Editors*

Our zip editor is Vertical
•Identical function for vertical kanji or for Chinese, or other vertical alphabets •Interesting variant: linking vertical writing to horizontal writing

***ALTERNATIVE DESIGNS FOR ZIP VISUALIZATION with Hyperarchy***
***Rays, Fans***
***Projection***

8

## *Other Possible Transparallel Media*

**COULD HAVE A TRANSPARALLEL WEB BROWSER**
Indeed, Netscape could be adapted to show side by side the Web pages you are going FROM and the Web pages you are going TO.

[pic:
Transparallel Web Browser]

**TRANSPARALLEL DATABASE** • queriable data points yield indiv. record & same data pt in other graph -- Prof. Chiba
As processor power grows-- for instance, video in multiple windows-- more and more desirable structures

TRANSPARALLEL FILM AND VIDEO: HALT ACTION IN ONE WINDOW, SEE SAME SHOT IN ANOTHER CONTEXT
Leni Riefenstahl example

[Rollover pic:
TRANSCLUSIVE
RIEFENSTAHL MOVIE]

## *Substruction*

## *UNIVERSAL TRANSMEDIA My General Proposal.*

**Universal Transmedia (my general Xanadu proposal)**

**The Xanadu idea of making everything mutually parallelizable.**

## *Generalized Transparallel Media: the Full Xanadu Proposal*

• HIGHLY GENERALIZED transparallel world
Xanadu is a Substructure for the manipulation and viewing of EVOLVING TRANSPARALLEL STRUCTURES.
The global Xanadu proposal is A PROPOSAL FOR A DIFFERENT FORM OF INFORMATION WHERE EVERYTHING CAN BE FREELY RE-USED AND EASILY INTERCOMPARED.

***Other Visualizations of Generalized Transparallel Media*** •Columnar •Rays •Fans •Light up to show correspondences (used in various Macintosh programs) •Annular •Zooms etc. •Transparency, semitransparency •parallel 3D windows •Aspen-tape switching

(TRANSCOPYRIGHT • A legal and business issue, not to be discussed here)

***FUTURE DESIGNS***

## *Theoretical Issues*

INTERFACES • Interfaces are arbitrary •CLOSER TO THE DATA STRUCTURE, THE BETTER I LIKE IT

SUBSTRUCTION AS A THEORETICAL ISSUE
Is transclusion a SUBSTRUCTURE? Or a METASTRUCTURE?
WHAT'S THE DIFFERENCE BETWEEN SUBSTRUCTURE AND METASTRUCTURE?
Ans. A Substructure should be what your main concepts are made out of;
metastructure, what you can make them into.
So I guess it's a metastructure, to be substructed variously.

0
•*New Functions and Their Substruction*
*Substruction versus Metastructure*
*SUBSTRUCTION OF THE DESIRED VIRTUALITY •for Outlining •for Printout •for Hyperarchy*

The difference between Substruction and Mere Implementation:
Substruction is creating CONCEPTS YOU'RE SUPPOSE TO KNOW ABOUT or BE INTERESTED IN.
SUBSTRUCTING a SUBVIRTUALITY •Eg textholes, textpipes
SUPERSTRUCTING A SUPERVIRTUALITY/METAVIRTUALITY •Eg combining 2D spreadsheets into ND spreadsheets
TRANS-STRUCTING?
OMNISTRUCTING? •SUBSTRUCTING, SUPERSTRUCTING and RESELECTING at the same time.

•Extending further (see Substruction). •Outside the visualization of the base data, it could go in many directions. •Adding functions make the possibilities much more varied. The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

RAYS AND FANS
Rays in the 1965 paper

• PROJECTIVE CONSTRUCTION ALTERNATIVES: Different Rays, Reflections, Magic Cookies

PROJECTIVE CONSTRUCTIONS AS A THEORETICAL AND INTERFACE ISSUE • CONSTRUCT LOGIC OF PROJECTIVE CONSTRUCTIONS

## HYPERARCHY AS A THEORETICAL AND INTERFACE ISSUE

The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

• CONSTRUCT LOGIC OF HYPERARCHY: the Mapping of Hyperarchy to Z65, Z96 • HYPERARCHY ALTERNATIVES: Transclusion Cuts • Outside Projections

## BIBLIOGRAPHY

• T. Nelson, LITERARY MACHINES EDITION 94.1. Mindful Press, 3020 Bridgeway Suite 295, Sausalito CA 94965, USA. • T. Nelson, "A File Structure for the Complex, the Changing and the Indeterminate." Proceedings of the ACM 1965 National Conference. • "The Heart of Connection: Hypermedia Unified by Transclusion." Communications of the ACM, August 1995.

## SUPPLEMENT:

# *HO d20* ----------

Transparallel transclusion means there are three things to understand: the object in Context A; the object in Context B; and the relation between them

---

THE 1965 PAPER

The Xanadu* project, started in 1960, is known for its ambitions of populist on-line publishing (1), a form of which has now been achieved by the World Wide Web. The Web has had the impact we expected for the Xanadu project.

The deeper objective of the Xanadu project is less well known: a new kind of universal digital medium, where all media objects can be freely re-used, interconnected and intercompared sideways-- while still respecting copyright.

We believe this is still a valid objective. It means two different forms of connection: LINKS, with which many people are now familiar, and TRANSCLUSIONS, or connections betwen parts which are the SAME-- instances which may be compared in different contexts (2). This enables any object to be in many places at once, with utter clarity as to its origin and ownership. This offers an interesting solution to the copyright issue.

Indeed, we believe that generalized transclusion offers a solution for the principal problems of hypermedia, and opens a much wider horizon for digital media-- which become no longer limited to separated objects.

While Project Xanadu has had considerable influence (arguably as the basis for HyperCard, World Wide Web and Lotus Notes), it has not yet shipped a product, partly due to the escalating ambition of its successive designs (1).

At the Sapporo HyperLab, we have gone back to basics to implement the most fundamental concept. A workstation implementation of the 1965 design (3) has been implemented, maintaining both links and transclusions in transparallel presentation. This can now be demonstrated on video, the first Xanadu-class system which can be shown with a user interface.

Meanwhile, Xanadu's transclusive copyright system has been redefined in an implementation-independent form, summarized by the word "transcopyright." This is a permission doctrine that allows material to be included virtually in any new on-line context, provided that each new recipient obtains the data elements from the rightsholder.

* Registered trademark of Project Xanadu, Sausalito, CA, USA.

1. T. Nelson, LITERARY MACHINES 93.1. Mindful Press, Sausalito CA.
2. T. Nelson, "The Heart of Connection: Hypermedia Unified by Transclusion." Communications of the Association for Computing Machinery, August 1995.
3. T. Nelson, "A File Structure for the Complex, The Changing and the Indeterminate." Proceedings of the Association for Computing Machinery 25th National Conference, 1965.
4. T. Nelson, "Transcopyright: Pre-Permission for Virtual Republication." Available from the author.

## *HO d19* ----------

**Summary of Presentation for 1996 IMAGINA Conference, Monte Carlo**

## *DEEPER CONNECTION FOR TOMORROW'S MEDIA*

This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation.
TRANSPARALLEL MEDIA IN THE PAPER WORLD

## *HO d18* ----------Transclusion allows the same thing to be in many places and intercompared in these different contexts.

## *HO d17* ----------intercompared sideways, part-for-part--

which are the SAME-- instances in new contexts (2).
wider vision of digital media

## *HO d15* ----------In a parallel development

transclusion still offers a solution

## *HO d14* ----------under the name "transcopyright."

## *FULL CONNECTION FOR TOMORROW'S MEDIA*

## *HO d12* ----------The system was designed to maintain two different forms of connection:

overlapping transclusions

## *HO d11* ----------

## *HO d10* ----------*XANADU IN THE WORLD:*

## *Transmedia for Tomorrow*

## *HO d9* ----------*[new]*

two different forms of connection were its design

*[previous draft]* ----------

## *XANADU MOVES INTO THE WORLD*

The Xanadu project* has a somewhat legendary status, due to its broad objectives and apparently considerable influence: indirect results of Project Xanadu already include, arguably, World Wide Web, HyperCard** and Lotus Notes**. However, no software product of signifcance has resulted directly from the work until the present.

The Xanadu project may be traced to a paper of thirty years ago (1) which introduced not only the words "hypertext" and "hypermedia," but also the ideas of transparallel electronic media and transclusion (not under those names). •

By transparallel media I mean any media where objects may be seen together with specific connections shown between their parts. (Examples from paper publishing include biological illustrations with captions and columnar presentation of text with side-by-side commentary. In transparallel media, the reader or user sees, and may seek to understand, at least three things: the first object, the second object, and the interconnections.

But the fundamental notion of the Xanadu project has been what we now call TRANSCLUSION (also "hot quote" or "live sharing). It means having access to the original of a piece of media from one of its re-uses. (Thus the re-use cannot be just a byte copy.) This has many purposes: intercomparison of context, understanding in different contexts, and a clean solution for copyright (to be discussed below). It is equivalent to putting THE ORIGINAL PIECE OF MEDIA (not a copy) in MANY SEPARATE CONTEXTS.

The Xanadu project, above all, has promoted a GENERAL META-DESIGN FOR ALL MEDIA, where transclusion may be used freely for both understanding and convenience. We now call this GENERAL OPEN TRANSMEDIA (as described in (2), though not under that name)-- the general situation where anyone may quote and link to anything, without copyright hindrance.

World Wide Web has shown the benefits of network hypertext publishing; but we may now see concretely the inconvenience of having only one-way links, no way to follow them to their origin, no way to quote material already published by others, and no stable committed publication: Web pages disappear unpredictably like popping bubbles. The Xanadu design was created in anticipation of all these problems.

The implementation sponsored at Autodesk from 1988 to 1992 is still underway (2), but considerably hampered by lack of resources. Meanwhile, new large-scale designs and new implementations are underway, based on the realities of the Internet and such developments as the apparent coup d'etat of the Internet by Netscape.

In the meantime, back-to-basics implementation at Sapporo HyperLab, to clarify what has been possible all along

MEDIA AND WORK SYSTEMS • A CONTINUUM, DEEPLY RELATED • book is more fixed, manuscripts andc. are more sprawling • Thus we might think that work systems were more broad than media • However, as nonsequential media become more widespread, they need corresponding work systems • Such work systems can be distributed with media themselves

HYPERMEDIA, AS THEY HAVE BECOME POPULAR • WHAT THEY DON'T KNOW • The original Hypermedia Paper had Transclusion

XANALOGICAL SYSTEMS • TWO RELATIONSHIPS • No overlap: ZIPPER LISTS, or Zips

TRANSPARALLEL MEDIA • Side-by-side or connecting media • TRANSPARALLEL MEDIA IN THE PAPER WORLD • TRANSPARALLEL MEDIA ON SCREENS • TRANSPOINTING WINDOWS • ZIPPER LISTS • VERSIONING • Marching Versions • Captions • Details • Disagreements • Corroborations • Footnotes • Expansions • HISTORICAL TRANSPARALLEL MEDIA: Bible(s), Talmud, Shakespeare, Nabokov, Pavic • DIFFERENT TPL LAYOUTS: columns, multiwindow, annular...

HL96 • THE SPECIFIC IMPLEMENTATION of the 1965 design by Mr. K. Ookubo • THE VARIOUS THINGS HL96 COULD DO • Data Types • Hierarchy • Hyperarchy

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BIBLIOGRAPHY. • (1) T. Nelson, "A File Structure for the Complex, the Changing and the Indeterminate." Proceedings of the ACM 1965 National Conference. • (2) T. Nelson, LITERARY MACHINES EDITION 94.1. Mindful Press, 3020 Bridgeway Suite 295, Sausalito CA 94965, USA. • (3) "The Heart of Connection: Hypermedia Unified by Transclusion." Communications of the ACM, August 1995.

HYPERARCHY AS A THEORETICAL AND INTERFACE ISSUE

Fundamental notion of TRANSCLUSION (hot quote, live sharing) -- ACCESS TO ORIGINAL FROM ANY RE-USE • Equivalent to putting ONE ORIGINAL (not copy) in MANY CONTEXTS
Numerous possible consequences and uses
So the problem of INTERCOMPARING CONTEXTS (TPL MEDIA)
***Theoretically:*** TRANSCOPYRIGHT: A WIN-WIN COPYRIGHT ARRANGEMENT • Esp. suited to small publishers • Pre-permission arrangement for new contexts

***----- Concretely at HyperLab:***
Zip Editor (1965 design) - Web interface underway • (to be public domain software)
The Sapporo HyperLab has been put together to support international cooperation in computer research, with the generous support of a number of companies***.
*** Specifically the generous support of (in alphabetical order), ASCII Corporation, Fuji Xerox, Fujitsu, Hitachi, Hokkaido University, Mallicoat Consulting, NTT, Sapporo Electronic Center, Technova, Xanadu Hypercompany.

HOzone

# *HO d2* ----------

words words words words words words words words words words '''

## *HO d3* ----------

# *as exemplified by the HyperLab Zip Editor*

## *HO d4* ----------

***TRANSPARALLEL MEDIA***
***AND WORK SYSTEMS:***
***The HyperLab Zip Editor as Prototype***

Difficulties of implementation and organizational politics have slowed things down – not known whether that implementation will work
SUPPLEMENT: THE 1965 PAPER
(TRANSCOPYRIGHT • A legal and business issue, not to be discussed here)
INTERFACES • Interfaces are arbitrary
Z65 • The 1965 system represents a very simple and CLEAN design • Sufficient for Highly Complex Work • The 1965 big illustration
Summary of Paper: The original article introducing the idea of hypertext discussed not only links but transclusion (a term introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation. The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.
Summary of Theoretical Issues: • TRANSCLUSION • TRANSPARALLEL MEDIA • VIRTUALITY & the DESIGN OF CONSTRUCT LOGIC • HYPERARCHY & Hyperarchical Editing • CONSTRUCT LOGIC OF HYPERARCHY • INTERFACES • Projective Construction Operations

## *HO d5* ----------

• CONSTRUCT LOGIC OF HYPERARCHY: the Mapping of Hyperarchy to Z65, Z96 • HYPERARCHY ALTERNATIVES: Transclusion Cuts • Outside Projections
PROJECTIVE CONSTRUCTIONS AS A THEORETICAL AND INTERFACE ISSUE • CONSTRUCT LOGIC OF PROJECTIVE CONSTRUCTIONS: the Mapping of Hyperarchy to Z65, Z96 • PROJECTIVE CONSTRUCTION ALTERNATIVES: Different Rays, Reflections, Magic Cookies
• TOWARD A FORMAL DEFINITION OF XANALOGICAL SYSTEMS • A Typology of Xanalogical Systems • DISCRETE XANALOGICAL SYSTEMS

## *HO d6* ----------

***[shrinking the HOs that came from zip.report.d7]***

## *HO d7* ----------

A broader concept is GENERAL OPEN TRANSMEDIA (as described in (2)

## *HO d8* ----------

## *HO d9* ----------

## *HO d13* ----------

[As presented to YT at meeting at Hokudai, 96.01.23.]



REF

# TRANSPARALLEL MEDIA AND WORK SYSTEMS

## *The HyperLab Zip Editor as Prototype*

---------- Theodor Holm Nelson
Sapporo HyperLab
Sapporo Electronic Center, Technopark, Sapporo, Hokkaido, Japan
Telephone 807-6061
Fax 807-6062
e-mail: ted@xanadu.net ----------

0

## *Summary.*

This paper discusses a new type of electronic medium and system of work (originally proposed by the author in 1965), now implemented both on workstations and the Internet.

The original 1965 article which introduced the idea of hypertext discussed not only links but transclusion (though the term was introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation.

It offers both links (as in conventional hypermedia) and transclusion, or instancing in comparable contexts.

•The current implementation is built around IntelligentPad as a working interface, but has functions that can be used through World Wide Web browsers.

The most unusual aspect may be the implementation of hyperarchical

outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

Keywords: • TRANSCLUSION • TRANSPARALLEL MEDIA • VIRTUALITY & the DESIGN OF CONSTRUCT LOGIC • HYPERARCHY & Hyperarchical Editing • CONSTRUCT LOGIC OF HYPERARCHY • INTERFACES • Projective Construction Operations

1

# *[Body of Paper]*

## *Intro*

This paper discusses a new type of electronic medium and system of work (originally proposed by the author in 1965 (citation)), now implemented both on workstations and the Internet. It offers both links (as in conventional hypermedia) and transclusion, or instancing in comparable contexts.

This paper focuses entirely on design issues, as the implementation is discussed in detail elsewhere, in papers by my colleagues.

**TRANSCLUSION IS AN OLD IDEA** •It is ironic that while the whole world now knows hypertext, they only know half of the original idea. People are familiar with links but not transclusion. The original 1965 article introducing the idea of hypertext discussed not only links but transclusion (a term introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses design issues of such systems. Other papers by my colleagues deal with the implementation in detail.

## *WORK ENVIRONMENTS AND THEIR VARIETY*

***(For Text Editing •For Outlining •For Resource Management •For Overview • For Versioning)***

Word processing environment as the center is popular, eg Microsoft Office, ClarisWorks

Likewise integrated software suites

Likewise EMACS, for some

Likewise CASE tools

***Transparallel Media for the Work Environment***

As a working system, transparallel media show great promise as a unifying framework to simplify work while adding more functionality

•As a working system it offers a new kind of overview, and compresses a number of useful functions into one system of visualization.

***Transparallel Media for Transmission, Sharing and Publication***

As media it suggests a new kind of distributable and publishable hypertext.

As media, transparallel materials may be distributed as packages. There exists also the idea of being able to make comments amongst such sections.

This leads to the notion of MUTUALLY PARALLEL MEDIA STRUCTURES AND PUBLISHABLE OBJECTS

(Which leads to the Xanadu idea of making everything mutually parallelizable.)

## *WORK ENVIRONMENTS AND MEDIA*

**RELATION OF MEDIA TO WORK SYSTEMS** • A book is more fixed than a manuscript; working papers, manuscripts and the like are

more sprawling, and do not attempt to give a closed appearance of perfection and completion.

A work system is an environment that can be used for doing things. There are few highly general work systems, however, that are suited to a wide variety of tasks.

Whereas media are bodies of material representing a point of view, in which works are created. •A "work" is hence more fixed; therefore less demanding than a work system, which must have various provisions for work in progress and interconnections i various directions.

• Thus we might think that work systems were more broad than media. However, as soon as a work system is created, someone finds a way to make it a medium, passing along the partial products of that work system.

•However, as nonsequential media become more widespread, they need corresponding work systems • Such work systems can be distributed with media themselves

**HYPERMEDIA**, AS THEY HAVE BECOME POPULAR, have involved surprises, clearing the screen completely, moving from one environment to another. And nothing can typically be used twice in today's hypermedia, except anonymously, with no connection to its original.

• **WHAT THEY DON'T KNOW** • Irony: The original Hypermedia Paper had Transclusion

***DISCRETE TRANSPARALLEL CORRESPONDENCE***

## *Transparallel Viewing*

By "transparallel" I mean viewable with element-to-element connection, or with global connection.

This can be either between portions of data, or cuts (points between data) or anchors, or whole items or records. •It can be between things which are the same or different.

***DISCRETE TRANSPARALLEL CORRESPONDENCE***

•Element-to-element could mean among anchors, among slits, among characters, among paragraphs, among larger textual units, or any combination of the above.

[rollover pic:
explicit connection between biological object / skeleton and captions.]

***CONTINUOUS TRANSPARALLEL CORRESPONDENCE***

**TRANSPARALLEL TISSUES.** These are structures with global correspondences, not linked in particular parts but having overall correspondences which may be maintained and viewed.

[pic:
TRANSPARALLEL TISSUES]

[rollover pic:
OVERLAYS]

# TRANSPARALLEL MEDIA AND WORK SYSTEMS

TRANSPARALLEL MEDIA & WORK SYSTEMS: specific connections and correspondences between specific parts, or between and among tissues

Transparallel media give you three things to learn: 1. The meaning of the picture in context A. 2. The meaning of the picture in context B. 3. THE RELATIONSHIP BETWEEN the picture in context A and the picture in context B.

# TRANSPARALLEL MEDIA

• Side-by-side

•There have always been non-electronic transparallel media. •As an electronic medium, transparallel media offers a new kind of overview and compresses a number of useful functions into one system of visualization.

• **TRANSPOINTING WINDOWS** •In Xanadu designs since at least the mid-sixties •still not implemented EXCEPT BY TOLKACHOV

**DIFFERENT TRANSPARALLEL LAYOUTS**: columns, multiwindow, annular...

•As media it suggests a new kind of hypertext.

•As a working system it offers a new kind of overview

***TEXT TRANSPARALLEL VIEWS***

[rollover pic:
Different versions of Bible,
Shakespeare]

**GRAPHICAL TRANSPARALLEL STRUCTURES**

**HISTORY OF TRANSPARALLEL MEDIA (to 1965)**

**HISTORICAL TRANSPARALLEL TEXTS:**•THE ROSETTA STONE •Hexapla of Origen (six Bibles side by side) •The New Testament

**TRANSPARALLEL HYPERTEXT** • The Talmud •Variorum Shakespeare •The Interpreter's Bible •Nabokov, *Pale Fire* •Pavic, Dictionary of the Khazars

***TRANSPARALLEL ILLUSTRATIONS*** •LONG TRADITION, NB Tufte •Grey's Anatomy etc.

**TN's 1965 PAPER** (defining) •In 1965 I published a paper entitled "A File Structure for the Complex, the Changing and the Indetereminate" (BIB).

It advocated computers for personal use, and work environments for professional users. •It also presented a design for such professional users, which was a discrete editing system for what I then called "zippered lists" (now shortened to *zips*). •From a historical point of view it may be seen as creating a dividing point between the accidental transparallel media in existence up to that point, and the potential new world of transparallel work. •We will return to this design later.

• **TRANSPARALLEL MEDIA ON SCREENS SINCE 1965**
•Transparallel Video: THE ASPEN TAPE (by Kristina Hooper and others, at MIT's Media Lab), presented an explorable video of Aspen, Colorado, as filmed identically at different seasons of the year. The user could not only choose different turns at each intersection (the HYPER level), but also switch in the same shot to different seasons of the year. This is Transparallel, since there is a direct connection between four different hypertissues. This was transparallel correspondence.
¶TRANSPARALLEL 3D GRAPHICAL SYSTEMS. AutoCAD, and similar systems, have established a tradition of "layers" which are no longer two-dimensional.

[pic:
"The Aspen Tape"]

[pic:
AutoCAD "layers"]

## *CONNECTIONS*

*1. LINKS* •thought by many to define hypermedia •**LINKS**-- better understood •TRANSPARALLEL VIEWING OF LINKS NOT UNDERSTOOD

*2. TRANSCLUSIONS: PUTTING A THING IN MANY CONTEXTS*

**TRANSCLUSION** • How can one thing be in a number of contexts at once?

[rollover pic:
ONE ITEM IN MANY
CONTEXTS]

• Functions of transclusion • Fundamental notion of TRANSCLUSION (hot quote, live sharing) -- ACCESS TO ORIGINAL FROM ANY RE-USE • Equivalent to putting ONE ORIGINAL (not copy) in MANY CONTEXTS •"hot quotes" •think of TCL as multiple threading

[rollover pic:
YOU CAN SEE THAT THE
PIECE IS THE SAME]

[rollover pic:
ONE REAL OBJECT IN
MANY CONTEXTS]

[rollover pic:
REPRESENTATION OF
TRANSCLUSION:
THE SAME PIECE IN
MANY DOCUMENTS]

***LINK AND TRANSCLUSION TOGETHER***
Links and Transclusions are complementary

**TRANSPARALLEL TRANSCLUSION.** •THE SAME THING IN MORE THAN ONE CONTEXT.

[pic:
LATTICE OF
XANALOGICAL AND
TRANSPARALLEL
SYSTEMS]

FIRST IMAGINE A TRANSPARALLEL SYTEM WITH LINKS ONLY.
•Then transparallel with Transclusions only. •Then both. •Overlapping

•Non-overlapping

## XANALOGICAL SYSTEMS

Xanalogical systems are computer systems which offer both links and transclusions. **DUALITY OF VIEWS.** 1. Anything can be in many places at once. 1. Different instances are identified as the same.

• **TOWARD A FORMAL DEFINITION OF XANALOGICAL SYSTEMS** • TWO RELATIONSHIPS • A Typology of Xanalogical Systems • **DISCRETE XANALOGICAL SYSTEMS** • No overlap: ZIPPER LISTS, or Zips

## *THE 1965 DESIGN*

***Discrete Zipper List*** •COLUMNAR ARRANGEMENT •NO OVERLAP OF ITEMS •LINKS NOT TYPED •LOCAL ONLY
**ZIPPER LISTS**, a simple case

[pic:
LATTICE OF
XANALOGICAL AND
TRANSPARALLEL
SYSTEMS]

**Z65** • The 1965 system represents a very simple and CLEAN design • Sufficient for Highly Complex Work

• The 1965 big illustration:

[rollover pic:
BIG ILLUSTRATION FROM
1965]

• Zipper lists for VERSIONING • Marching Versions • Captions • Details • Disagreements • Corroborations • Footnotes • Expansions • ***For Text Editing •For Outlining •For Resource Management •For Overview***

## *DISCUSSION OF USES*

***Simple Uses of the 1965 Design***
Word Processing
Email
Outlining
Organization of work
Version management -- successive and alternative
MARCHING TRANSPARALLEL VERSIONS

[pic:
Marching Transparallel
Versions]

Hyperarchy

***Outside the Base Data Level of Visualization***
EVEN WITH THESE SIMPLE DATA STRUCTURES, there are many

possible vizns
Extending further (see Substruction). •Outside the visualization of the base data, it could go in many directions. •Adding functions make the possibilities much more varied.

***Additional functions needed***
Other functions need to be added; this raises interesting design issues (see Substruction of the Virtuality, below). •Assembly of Linear Versions •Printing •Comparison of Alternative Versions

## *THE CURRENT IMPLEMENTATION*

***Principal Features of Current Version***
**HL96**
INTELLIGENTPAD •The current implementation is built around IntelligentPad as a working interface, but has functions that can be used through World Wide Web browsers. •NICE REMARKS about INTELLIGENTPAD
At the data level (and in its basic visualization), the current implementation exactly implements the original design of the 1965 paper (citation)
STRUCTURE •Text Items •Zips •Links •Transclusions
•items may not overlap •simple untyped links •transclusion •each cell may connect to ONE OTHER CELL in each other Zip

• THE SPECIFIC IMPLEMENTATION • THE VARIOUS THINGS HL96 COULD DO • Data Types • Hierarchy • Hyperarchy

***Visualization of the Current Version***
(At the data level and) in its basic visualization, the visualization of the current workstation implementation exactly implements the original design of the 1965 paper (citation). •It SIMPLY SHOWS THE DATA STRUCTURE, as in the 1965 design.

## *Visualizations of Zip Editors*

Our zip editor is Vertical
•Identical function for vertical kanji or for Chinese, or other vertical alphabets •Interesting variant: linking vertical writing to horizontal writing

***ALTERNATIVE DESIGNS FOR ZIP VISUALIZATION with Hyperarchy***
***Rays, Fans***
***Projection***

8

## *Other Possible Transparallel Media*

**COULD HAVE A TRANSPARALLEL WEB BROWSER**
Indeed, Netscape could be adapted to show side by side the Web pages you are going FROM and the Web pages you are going TO.

[pic:
Transparallel Web Browser]

**TRANSPARALLEL DATABASE** • queriable data points yield indiv. record & same data pt in other graph -- Prof. Chiba
As processor power grows-- for instance, video in multiple windows-- more and more desirable structures

TRANSPARALLEL FILM AND VIDEO: HALT ACTION IN ONE WINDOW, SEE SAME SHOT IN ANOTHER CONTEXT

Leni Riefenstahl example

[Rollover pic:
TRANSCLUSIVE
RIEFENSTAHL MOVIE]

***Substruction***

***UNIVERSAL TRANSMEDIA***
***My General Proposal.***

**Universal Transmedia (my general Xanadu proposal)**

**The Xanadu idea of making everything mutually parallelizable.**

***Generalized Transparallel Media: the Full Xanadu Proposal***

• HIGHLY GENERALIZED transparallel world
Xanadu is a Substructure for the manipulation and viewing of EVOLVING TRANSPARALLEL STRUCTURES.
The global Xanadu proposal is A PROPOSAL FOR A DIFFERENT FORM OF INFORMATION WHERE EVERYTHING CAN BE FREELY RE-USED AND EASILY INTERCOMPARED.

***Other Visualizations of Generalized Transparallel Media***
•Columnar •Rays •Fans •Light up to show correspondences (used in various Macintosh programs) •Annular •Zooms etc. •Transparency, semitransparency •parallel 3D windows •Aspen-tape switching

(**TRANSCOPYRIGHT** • A legal and business issue, not to be discussed here)

***FUTURE DESIGNS***

## *Theoretical Issues*

**INTERFACES** • Interfaces are arbitrary •CLOSER TO THE DATA STRUCTURE, THE BETTER I LIKE IT

**SUBSTRUCTION AS A THEORETICAL ISSUE**
**Is transclusion a SUBSTRUCTURE? Or a METASTRUCTURE?**
**WHAT'S THE DIFFERENCE BETWEEN SUBSTRUCTURE AND METASTRUCTURE?**
**Ans. A Substructure should be what your main concepts are <u>made out of</u>;**
**metastructure, <u>what you can make them into</u>.**
**So I guess it's a metastructure, to be substructed variously.**

0
***•New Functions and Their Substruction***
***Substruction versus Metastructure***
***SUBSTRUCTION OF THE DESIRED VIRTUALITY •for Outlining •for Printout •for Hyperarchy***

The difference between Substruction and Mere Implementation:
Substruction is creating CONCEPTS YOU'RE SUPPOSE TO KNOW ABOUT or BE INTERESTED IN.
SUBSTRUCTING a SUBVIRTUALITY •Eg textholes, textpipes

SUPERSTRUCTING A SUPERVIRTUALITY/METAVIRTUALITY •Eg combining 2D spreadsheets into ND spreadsheets
TRANS-STRUCTING?
OMNISTRUCTING? •SUBSTRUCTING, SUPERSTRUCTING and RESELECTING at the same time.

•Extending further (see Substruction). •Outside the visualization of the base data, it could go in many directions. •Adding functions make the possibilities much more varied.
The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

RAYS AND FANS
Rays in the 1965 paper

• **PROJECTIVE CONSTRUCTION ALTERNATIVES**: Different Rays, Reflections, Magic Cookies

**PROJECTIVE CONSTRUCTIONS** AS A THEORETICAL AND INTERFACE ISSUE • **CONSTRUCT LOGIC OF PROJECTIVE CONSTRUCTIONS**

# HYPERARCHY
## AS A THEORETICAL AND INTERFACE ISSUE

The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

• **CONSTRUCT LOGIC OF HYPERARCHY**: the Mapping of Hyperarchy to Z65, Z96 • **HYPERARCHY ALTERNATIVES**:

Transclusion Cuts • Outside Projections

## BIBLIOGRAPHY

• T. Nelson, LITERARY MACHINES EDITION 94.1. Mindful Press, 3020 Bridgeway Suite 295, Sausalito CA 94965, USA. • T. Nelson, "A File Structure for the Complex, the Changing and the Indeterminate." Proceedings of the ACM 1965 National Conference. • "The Heart of Connection: Hypermedia Unified by Transclusion." Communications of the ACM, August 1995.

## SUPPLEMENT:

newpage

# HO d20 ----------

---

Transparallel transclusion means there are three things to understand: the object in Context A; the object in Context B; and the relation between them

---

THE 1965 PAPER

The Xanadu* project, started in 1960, is known for its ambitions of populist on-line publishing (1), a form of which has now been achieved by the World Wide Web. The Web has had the impact we expected for the Xanadu project.

The deeper objective of the Xanadu project is less well known: a new kind of universal digital medium, where all media objects can be freely re-used, interconnected and intercompared sideways-- while still respecting copyright.

We believe this is still a valid objective. It means two different forms of connection: LINKS, with which many people are now familiar, and TRANSCLUSIONS, or connections betwen parts which are the SAME-- instances which may be compared in different contexts (2). This enables any object to be in many places at once, with utter clarity as to its origin and ownership. This offers an interesting solution to the copyright issue.

Indeed, we believe that generalized transclusion offers a solution for the principal problems of hypermedia, and opens a much wider horizon for digital media-- which become no longer limited to separated objects.

While Project Xanadu has had considerable influence (arguably as the basis for HyperCard, World Wide Web and Lotus Notes), it has not yet shipped a product, partly due to the escalating ambition of its successive designs (1).

At the Sapporo HyperLab, we have gone back to basics to implement the most fundamental concept. A workstation implementation of the 1965 design (3) has been implemented, maintaining both links and transclusions in transparallel presentation. This can now be demonstrated on video, the first Xanadu-class system which can be shown with a user interface.

Meanwhile, Xanadu's transclusive copyright system has been redefined in an implementation-independent form, summarized by the word "transcopyright." This is a permission doctrine that allows material to be included virtually in any new on-line context, provided that each new recipient obtains the data elements from the rightsholder.

* Registered trademark of Project Xanadu, Sausalito, CA, USA.

1. T. Nelson, LITERARY MACHINES 93.1. Mindful Press, Sausalito CA.
2. T. Nelson, "The Heart of Connection: Hypermedia Unified by Transclusion." Communications of the Association for Computing Machinery, August 1995.
3. T. Nelson, "A File Structure for the Complex, The Changing and the Indeterminate." Proceedings of the Association for Computing Machinery 25th National Conference, 1965.
4. T. Nelson, "Transcopyright: Pre-Permission for Virtual Republication." Available from the author.

# *HO d19* ----------

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**Summary of Presentation for 1996 IMAGINA Conference, Monte Carlo**

# *DEEPER CONNECTION FOR TOMORROW'S MEDIA*

This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation.
TRANSPARALLEL MEDIA IN THE PAPER WORLD

## *HO d18* ----------

----------Transclusion allows the same thing to be in many places and intercompared in these different contexts.

## *HO d17* ----------

----------intercompared sideways, part-for-part--
which are the SAME-- instances in new contexts (2).
wider vision of digital media

## *HO d15* ----------

----------In a parallel development
transclusion still offers a solution

## *HO d14* ----------

----------under the name "transcopyright."

# *FULL CONNECTION FOR TOMORROW'S MEDIA*

## *HO d12* ----------

----------The system was designed to maintain two different forms of connection: overlapping transclusions

## *HO d11* ----------

---

## *HO d10* ----------

---

# *XANADU IN THE WORLD: Transmedia for Tomorrow*

# *HO d9* ----------
## ----------*[new]*

two different forms of connection were its design

## *[previous draft]* ----------
## ----------
## *XANADU MOVES INTO THE WORLD*

The Xanadu project* has a somewhat legendary status, due to its broad objectives and apparently considerable influence: indirect results of Project Xanadu already include, arguably, World Wide Web, HyperCard** and Lotus Notes**. However, no software product of signifcance has resulted directly from the work until the present.

The Xanadu project may be traced to a paper of thirty years ago (1) which introduced not only the words "hypertext" and "hypermedia," but also the ideas of transparallel electronic media and transclusion (not under those names). •

By transparallel media I mean any media where objects may be seen together with specific connections shown between their parts. (Examples from paper publishing include biological illustrations with captions and columnar presentation of text with side-by-side commentary. In transparallel media, the reader or user sees, and may seek to understand, at least three things: the first object, the second object, and the interconnections.

But the fundamental notion of the Xanadu project has been what we now call TRANSCLUSION (also "hot quote" or "live sharing). It means having access to the original of a piece of media from one of its re-uses. (Thus the re-use cannot be just a byte copy.) This has many purposes: intercomparison of context, understanding in different contexts, and a clean solution for copyright (to be discussed below). It is equivalent to putting THE ORIGINAL PIECE OF MEDIA (not a copy) in MANY SEPARATE CONTEXTS.

The Xanadu project, above all, has promoted a GENERAL META-DESIGN FOR ALL MEDIA, where transclusion may be used freely for both understanding and convenience. We now call this GENERAL OPEN TRANSMEDIA (as described in (2), though not under that name)-- the general situation where anyone may quote and link to anything, without copyright hindrance.

World Wide Web has shown the benefits of network hypertext publishing; but we may now see concretely the inconvenience of having only one-way links, no way to follow them to their origin, no way to quote material already published by others, and no stable committed publication: Web pages disappear unpredictably like popping bubbles. The Xanadu design was created in anticipation of all these problems.

The implementation sponsored at Autodesk from 1988 to 1992 is still underway (2), but considerably hampered by lack of resources. Meanwhile, new large-scale designs and new implementations are underway, based on the realities of the Internet and such developments as the apparent coup d'etat of the Internet by Netscape.

In the meantime, back-to-basics implementation at Sapporo HyperLab, to clarify what has been possible all along

**MEDIA AND WORK SYSTEMS** • A CONTINUUM, DEEPLY RELATED • book is more fixed, manuscripts andc. are more sprawling • Thus we might think that work systems were more broad than media • However, as nonsequential media become more widespread, they need corresponding work systems • Such work systems can be distributed with media themselves

**HYPERMEDIA**, AS THEY HAVE BECOME POPULAR • **WHAT THEY DON'T KNOW** • The original Hypermedia Paper had Transclusion

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**HL96** • THE SPECIFIC IMPLEMENTATION of the 1965 design by Mr. K. Ookubo • THE VARIOUS THINGS HL96 COULD DO • Data Types • Hierarchy • Hyperarchy

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**BIBLIOGRAPHY.** • (1) T. Nelson, "A File Structure for the Complex, the Changing and the Indeterminate." Proceedings of the ACM 1965 National Conference. • (2) T. Nelson, LITERARY MACHINES EDITION 94.1. Mindful Press, 3020 Bridgeway Suite 295, Sausalito CA 94965, USA. • (3) "The Heart of Connection: Hypermedia Unified by Transclusion." Communications of the ACM, August 1995.

**HYPERARCHY** AS A THEORETICAL AND INTERFACE ISSUE

Fundamental notion of TRANSCLUSION (hot quote, live sharing) -- ACCESS TO ORIGINAL FROM ANY RE-USE • Equivalent to putting ONE ORIGINAL (not copy) in MANY CONTEXTS
Numerous possible consequences and uses
So the problem of INTERCOMPARING CONTEXTS (TPL MEDIA)
***Theoretically:*** TRANSCOPYRIGHT: A WIN-WIN COPYRIGHT ARRANGEMENT • Esp. suited to small publishers • Pre-permission arrangement for new contexts

## ----- *Concretely at HyperLab:*

Zip Editor (1965 design) - Web interface underway • (to be public domain software)
The Sapporo HyperLab has been put together to support international

cooperation in computer research, with the generous support of a number of companies***.

*** Specifically the generous support of (in alphabetical order), ASCII Corporation, Fuji Xerox, Fujitsu, Hitachi, Hokkaido University, Mallicoat Consulting, NTT, Sapporo Electronic Center, Technova, Xanadu Hypercompany.

newpage
HOzone

# *HO d2* ----------

words words words words words words words words words words '''

## *HO d3* ----------

# *as exemplified by the HyperLab Zip Editor*

## *HO d4* ----------

***TRANSPARALLEL MEDIA***
***AND WORK SYSTEMS:***
***The HyperLab Zip Editor as Prototype***

Difficulties of implementation and organizational politics have slowed things down -- not known whether that implementation will work

**SUPPLEMENT**: THE 1965 PAPER

(**TRANSCOPYRIGHT** • A legal and business issue, not to be discussed here)

**INTERFACES** • Interfaces are arbitrary

**Z65** • The 1965 system represents a very simple and CLEAN design • Sufficient for Highly Complex Work • The 1965 big illustration

Summary of Paper: The original article introducing the idea of hypertext discussed not only links but transclusion (a term introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation. The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

Summary of Theoretical Issues: • TRANSCLUSION • TRANSPARALLEL MEDIA • VIRTUALITY & the DESIGN OF CONSTRUCT LOGIC • HYPERARCHY & Hyperarchical Editing • CONSTRUCT LOGIC OF HYPERARCHY • INTERFACES • Projective Construction Operations

## *HO d5* ----------

• **CONSTRUCT LOGIC OF HYPERARCHY**: the Mapping of Hyperarchy to Z65, Z96 • **HYPERARCHY ALTERNATIVES**: Transclusion Cuts • Outside Projectsions

**PROJECTIVE CONSTRUCTIONS** AS A THEORETICAL AND INTERFACE ISSUE • **CONSTRUCT LOGIC OF PROJECTIVE CONSTRUCTIONS**: the Mapping of Hyperarchy to Z65, Z96 • **PROJECTIVE CONSTRUCTION ALTERNATIVES**: Different Rays, Reflections, Magic Cookies

• **TOWARD A FORMAL DEFINITION OF XANALOGICAL SYSTEMS** • A Typology of Xanalogical Systems • **DISCRETE XANALOGICAL SYSTEMS**

## *HO d6* ----------

***[shrinking the HOs that came from zip.report.d7]***

***HO d7 ----------***
A broader concept is GENERAL OPEN TRANSMEDIA (as described in (2)

***HO d8 ----------***
***HO d9 ----------***

***HO d13 ----------***

# TRANSPARALLEL MEDIA AND WORK SYSTEMS

## *The HyperLab Zip Editor as Prototype*

**Theodor Holm Nelson**

**Sapporo HyperLab**

**Sapporo Electronic Center, Technopark, Sapporo, Hokkaido, Japan**

Submitted to: Journal of the Society of XXX

Published by the Sapporo HyperLab.

newpage

# *Summary.*

This paper discusses a new type of electronic medium and system of work (originally proposed by the author in 1965), now implemented both on workstations and the Internet.

The original 1965 article which introduced the idea of hypertext discussed not only links but transclusion (though the term was introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation.

It offers both links (as in conventional hypermedia) and transclusion, or instancing in comparable contexts.

•The current implementation is built around IntelligentPad as a working interface, but has functions that can be used through World Wide Web browsers.

The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

Keywords: • TRANSCLUSION • TRANSPARALLEL MEDIA • VIRTUALITY & the DESIGN OF CONSTRUCT LOGIC • HYPERARCHY & Hyperarchical Editing • CONSTRUCT LOGIC OF HYPERARCHY • INTERFACES • Projective Construction Operations

*newpage*

# *[Body of Paper]*

## *Intro*

This paper discusses a new type of electronic medium and system of work (originally proposed by the author in 1965 (citation)), now implemented both on workstations and the Internet. It offers both links (as in conventional hypermedia) and transclusion, or instancing in comparable contexts.

This paper focuses entirely on design issues, as the implementation is discussed in detail elsewhere.

**TRANSCLUSION IS AN OLD IDEA** •The original 1965 article introducing the idea of hypertext discussed not only links but transclusion (a term introduced later), and presented a unified design which has not been implemented until the present time. This paper discusses such an implementation, done at Sapporo HyperLab, and various concrete design aspects of that implementation.

**MEDIA AND WORK SYSTEMS** • A book is more fixed, manuscripts andc. are more sprawling • Thus we might think that work systems were more broad than media • However, as nonsequential media become more widespread, they need corresponding work systems • Such work systems can be distributed with media themselves

**HYPERMEDIA**, AS THEY HAVE BECOME POPULAR • **WHAT THEY DON'T KNOW** • Irony: The original Hypermedia Paper had Transclusion

•By "transparallel" I mean viewable with element-to-element connection. •As a working system it offers a new kind of overview, and compresses a number of useful functions into one system of visualization. •As media it suggests a new kind of hypertext. •Element-to-element could mean among anchors, among slits, among characters, among paragraphs, among larger textual units, or any combination of the above.

*newpage*

**TRANSPARALLEL MEDIA** • Side-by-side

***History of Transparallel Media*** • TRANSPARALLEL MEDIA IN THE PAPER WORLD

**HISTORICAL TRANSPARALLEL TEXTS:**
THE ROSETTA STONE
Hexapla of Origen

**TRANSPARALLEL HYPERTEXT**
Talmud
Variorum Shakespeare
The Interpreter's Bible
Nabokov, Pale Fire
Pavic, Dictionary of the Khazars

***TRANSPARALLEL ILLUSTRATIONS***
LONG TRADITION, NB Tufte
Grey's Anatomy etc.

**THE 1965 PAPER** (defining)

• **TRANSPARALLEL MEDIA ON SCREENS SINCE 1965**
TPL Video: THE ASPEN TAPE
TPL 3D gfx: AutoCAD "layers"

• **TRANSPOINTING WINDOWS** •still not implemented EXCEPT BY TOLKACHOV

**ZIPPER LISTS**, a simple case • Zipper lists for VERSIONING • Marching Versions • Captions • Details • Disagreements • Corroborations • Footnotes • Expansions • ***For Text Editing •For Outlining •For Resource Management •For Overview***

**DIFFERENT TPL LAYOUTS**: columns, multiwindow, annular...

newpage

# *Transparallel Viewing*

By "transparallel" I mean viewable with element-to-element connection.

# *Text Transparallel Views*

This can be either between portions of data, or cuts (points between data) or anchors, or whole items or records. •It can be between things which are the same or different.

Transparallel transclusion means there are three things to understand: the object in Context A; the object in Context B; and the relation between them.

**COULD HAVE A TPL WEB BROWSER**

newpage

# XANALOGICAL SYSTEMS

• **TOWARD A FORMAL DEFINITION OF XANALOGICAL SYSTEMS** • TWO RELATIONSHIPS • A Typology of Xanalogical Systems • **DISCRETE XANALOGICAL SYSTEMS** • No overlap: ZIPPER LISTS, or Zips

## *CONNECTIONS*

### *1. LINKS*

thought by many to define hypermedia

### *2. TRANSCLUSIONS*

**TRANSCLUSION** • Functions of transclusion • Fundamental notion of TRANSCLUSION (hot quote, live sharing) -- ACCESS TO ORIGINAL FROM ANY RE-USE • Equivalent to putting ONE ORIGINAL (not copy) in MANY CONTEXTS

"hot quotes"

LINKS-- better understood •TRANSPARALLEL VIEWING OF LINKS NOT UNDERSTOOD

TRANSCLUSION • How can one thing be in a number of contexts at once? think of TCL as multiple threading

## *LINK AND TRANSCLUSION TOGETHER*

Links and Transclusions are complementary

newpage

## *THE 1965 DESIGN*

***Discrete Zipper List*** •COLUMNAR ARRANGEMENT •NO OVERLAP OF ITEMS •LINKS NOT TYPED •LOCAL ONLY

**Z65** • The 1965 system represents a very simple and CLEAN design • Sufficient for Highly Complex Work • The 1965 big illustration

# *DISCUSSION OF USES*

## *Simple Uses of the 1965 Design*

Word Processing
Email
Outlining
Organization of work
Version management -- successive and alternative

w
y
z
Hyperarchy

## *Outside the Base Data Level of Visualization*

EVEN WITH THESE SIMPLE DATA STRUCTURES, there are many possible vizns

Extending further (see Substruction). •Outside the visualization of the base data, it could go in many directions. •Adding functions make the possibilities much more varied.

## *Additional functions needed*

Other functions need to be added; this raises interesting design issues (see Substruction of the Virtuality, below). •Assembly of Linear Versions •Printing •Comparison of Alternative Versions

*newpage*

# *THE CURRENT IMPLEMENTATION*
## *Principal Features of Current Version*

**HL96**

INTELLIGENTPAD •The current implementation is built around IntelligentPad as a working interface, but has functions that can be used through World Wide Web browsers. •NICE REMARKS about INTELLIGENTPAD

At the data level (and in its basic visualization), the current implementation exactly implements the original design of the 1965 paper (citation)

STRUCTURE •Text Items •Zips •Links •Transclusions

•items may not overlap •simple untyped links •transclusion •each cell may connect to ONE OTHER CELL in each other Zip

• THE SPECIFIC IMPLEMENTATION • THE VARIOUS THINGS HL96 COULD DO • Data Types • Hierarchy • Hyperarchy

## *Visualization of the Current Version*

(At the data level and) in its basic visualization, the visualization of the current workstation implementation exactly implements the original design of the 1965 paper (citation). •It SIMPLY SHOWS THE DATA STRUCTURE, as in the 1965 design.

*newpage*

## *WORK ENVIRONMENTS & THEIR VARIETY (For Text Editing •For Outlining •For Resource Management •For Overview • For Versioning)*

Word processing environment as the center is popular, eg Microsoft Office, ClarisWorks
Likewise integrated software suites
Likewise EMACS, for some
Likewise CASE tools

## *Transparallel Media for the Work Environment*

As a working system, transparallel media show great promise as a unifying framework to simplify work while adding more functionality
•As a working system it offers a new kind of overview, and compresses a number of useful functions into one system of visualization.

## *Transparallel Media for Transmission, Sharing and Publication*

As media it suggests a new kind of distributable and publishable hypertext.
As media, transparallel materials may be distributed as packages. There exists also the idea of being able to make comments amongst such sections.

This leads to the notion of MUTUALLY PARALLEL MEDIA STRUCTURES AND PUBLISHABLE OBJECTS
(Which leads to the Xanadu idea of making everything mutually parallelizable.)

## *Visualizations of Zip Editors*

## *Versioning: MARCHING TRANSPARALLEL VERSIONS*

*newpage*

***Other Visualizations of Zip Editors*** •Our zip editor is Vertical •Identical function for vertical kanji or for Chinese, or other vertical alphabets •Interesting variant: linking vertical writing to horizontal writing

***ALTERNATIVE DESIGNS FOR ZIP VISUALIZATION with Hyperarchy***
***Rays, Fans***
***Projection***

***OTHER ARRANGEMENTS OF MATERIAL***

*newpage*

## *Other Possible Transparallel Media*

**TRANSPARALLEL DATABASE** • queriable data points yield indiv. record & same data pt in other graph -- Prof. Chiba

As processor power grows-- for instance, video in multiple windows-- more and more desirable structures

TRANSPARALLEL FILM AND VIDEO: HALT ACTION IN ONE WINDOW, SEE SAME SHOT IN ANOTHER CONTEXT

Leni Riefenstahl example

**Universal Transmedia (my general proposal)**

*newpage*

# *Theoretical Issues*

**INTERFACES** • Interfaces are arbitrary •CLOSER TO THE DATA STRUCTURE, THE BETTER I LIKE IT

## *F•New Functions and Their Substruction*
## *Substruction versus Metastructure*
## *SUBSTRUCTION OF THE DESIRED VIRTUALITY*
## *•for Outlining •for Printout •for Hyperarchy*

A•Extending further (see Substruction). •Outside the visualization of the base data, it could go in many directions. •Adding functions make the possibilities much more varied.

The most unusual aspect may be the implementation of hyperarchical outlining, allowing several different hierarchies to be maintained and intercompared simultaneously.

**PROJECTIVE CONSTRUCTIONS** AS A THEORETICAL AND INTERFACE ISSUE • **CONSTRUCT LOGIC OF PROJECTIVE CONSTRUCTIONS**

• **PROJECTIVE CONSTRUCTION ALTERNATIVES**: Different Rays, Reflections, Magic Cookies

*newpage*

# HYPERARCHY AS A THEORETICAL AND INTERFACE ISSUE

• **CONSTRUCT LOGIC OF HYPERARCHY**: the Mapping of Hyperarchy to Z65, Z96 • **HYPERARCHY ALTERNATIVES**: Transclusion Cuts • Outside Projections

newpage

***Generalized Transparallel Media: the Full Xanadu Proposal*** • HIGHLY GENERALIZED transparallel world

***Other Visualizations of Generalized Transparallel Media*** •Annular •Zooms etc. •Transparency, semitransparency •parallel 3D windows •Aspen-tape switching

(**TRANSCOPYRIGHT** • A legal and business issue, not to be discussed here)

***FUTURE DESIGNS***

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**BIBLIOGRAPHY.** • T. Nelson, LITERARY MACHINES EDITION 94.1. Mindful Press, 3020 Bridgeway Suite 295, Sausalito CA 94965, USA. • T. Nelson, "A File Structure for the Complex, the Changing and the Indeterminate." Proceedings of the ACM 1965 National Conference. • "The Heart of Connection: Hypermedia Unified by Transclusion." [**CORRECT TITLE**] Communications of the ACM, August 1995.

**SUPPLEMENT**: THE 1965 PAPER

HOzone

# *HO d2* ----------

words words words words words words words words words words '"

## *HO zip.report.d3* ----------

# *as exemplified by the HyperLab Zip Editor*

## *HO tpl.mws.d4* ----------

# *HISTORY OF THE CONCEPT* --------- *FOR TEXTUAL RESOURCE MANAGEMENT*

*(TEXT. )*

## *HO d5* ----------

## *HO d6* ----------

## *HO d7* ----------

## *HO d8* ----------

## *HO d9* ----------

Summary of Paper:

Summary of Theoretical Issues:

HISTORICAL TRANSPARALLEL MEDIA:

•However, Mr. Ookubo's Web extensions no longer resemble the data structure

## *HO d10* ----------

----- ***SPECIAL CONTRIBUTIONS OF MR. K. OOKUBO:** •Implementation •Fitting it within the metaphor of IntelligentPad •Interface for the Web •implementation with Tcl •Interface design for the Web •free-standing Tcl implementation

**CREDIT** • implementation and various design specifics by Mr. Ookubo (YT TO BROKER EXACT CREDIT)

***HO d11*** ----------

•connections between non-overlapping portions of data

***HO d12*** ----------

***TRANSPARALLEL TEXT***

***HO d14*** ----------

(Fiddling & merging still)

***HO d14*** ----------
***HO d14*** ----------
***HO d14*** ----------
***HO d14*** ----------
***HO d14*** ----------
***HO d14*** ----------